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The impact of buyer-supplier cooperation and decision-making uncertainty on supply chain

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Abstract

Fast-changing consumer demand and preference in the fashion-oriented sporting goods industry intensify the retailer's perceived uncertainty in purchase decisions. To minimize retailers' decision-making uncertainty (DMU) , enhancing the cooperative relationships between the retailers and suppliers in such markets are of paramount importance to the supply chain performance. The aim of this study is to investigate how retailer-supplier cooperation and DMU affect the supply chain performance and how the relationship dimensions are related to cooperation and DMU. The results indicate that retailer-supplier cooperation and retai,ler's DMU had significant impact on supply chain performance in terms of financial and non-financial performance measures.

Keywords

impact, buyer, supplier, cooperation, decision, making, uncertainty, supply, chain

Disciplines

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THE IMPACT OF BUYER-SUPPLIER COOPERATION AND DECISION-MAKING UNCERTAINTY ON SUPPLY CHAIN PERFORMANCE

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ABSTRACT

Fast-changing consumer demand and preference in the fashion-oriented sporting goods industry intensify the retailer's perceived uncertainty in purchase decisions. To minimize retailers' decision-making uncertainty (DMU), enhancing the cooperative relationships between the retailers and suppliers in such markets are of paramount importance to the supply chain performance. The aim of this study is to investigate how retailer-supplier cooperation and DMU affect the supply chain performance and how the relationship dimensions are related to cooperation and DMU. The results indicate that retailer-supplier cooperation and retailer's DMU had significant impact on supply chain performance in terms of financial and non-financial performance measures.

INTRODUCTION

Buyer-supplier relationship development plays an important role in supply chain management in response to dynamic and unpredictable market changes. In volatile environment, firms strive to establish cooperative relationships with focal suppliers and reduce the effect of uncertainty on their purchase decision-making. Decision-making uncertainty (DMU) in retail buying decision refers that the decision makers experience difficulty in predicting the outcomes of a purchase due to information gaps (Duncan, 1972). Nowadays products such as sports apparel and footwear are more fashion-oriented and are characterized as short life cycle and unpredictable demand. The purchase of products is generally made several months ahead of the season. Sports specialty stores are the major channel of distribution, and this market is dominated by a few leading international suppliers. In such an unpredictable market, the cooperative relationships between the retailers and the suppliers are particularly critical as the uncertainties faced by retailers affect the relationship with their suppliers and address the needs of flexibility and responsiveness (Wathne and Heide, 2004).

During the last few years, some researchers have contended that it is possible to reduce the exchange partner's DMU by crafting better buyer-supplier relationships, such as trust (Gao *et al.*, 2005; Morgan and Hunt, 1994), *guanxi* (Lee *et al.*, 2001), communication (Johnson and Pharr, 1997), and commitment and dependence (Gao *et al.*, 2005). However, the majority of these studies investigated the relationships based on single factor. Moreover, none of these studies assessed the effect of DMU on the channel performance. There is a lack of understanding of the impact of DMU on supply chain performance. In this research, we focused on the relationships between preponderant small and medium-sized retailers and large international brand suppliers in the Chinese business context. The objectives of this research are (1) to identify the dimensions of retailer-supplier relationship and investigate their effect on cooperation, and DMU, and (2) to examine the impact of retailer-supplier cooperation and retailer's DMU on retail supply chain performance.

CONCEPTUAL FRAMEWORK

Cooperation is essential for exchange partners to achieve coordination in supply chains. To cope with highly uncertain demand in fast-changing market, retailers are demanding for greater supply flexibility and responsiveness from their suppliers. Studies showed that when parties cooperate, they understand each other's expectation and needs better, which eventually help them to achieve their mutual goals (Cannon and Perreault, 1999). In addition, cooperating firms tend to maintain the long-term relationships and enhance performance (Anderson and Narus, 1990; Ambler *et al.*, 1999).

Ettenson and Wagner (1986) argued that the purchasing decisions are critical to the profitability of retail firms. However, the unpredictable market demand can create uncertainty and risk for a buying firm in its purchasing decision process and a firm's performance (Cannon and Perreault, 1999). Uncertainty in decision-making refers to the extent to which an exchange partner, say a retailer, (1) has adequate information to make key decisions, (2) can predict the outcomes of the decisions, and (3) has confidence in the decisions made (Achrol and Stern, 1988). Literature has shown that building better relationships with focal exchange partners can serve as a proactive approach to help exchange partners to reduce uncertainty (Gao *et al.*, 2005; Johnson and Pharr, 1997).

Supply chain performance is a multi-faced issue in supply chain management. The objectives of performance measurement are to improve the efficiency and effectiveness of a supply chain (Gunasekaran *et al.*, 2001; Beamon, 1999). O'Toole and Donaldson (2002) suggested that the performance measures should include both financial performance and non-financial performance and investigate which measures are relevant and critical to retail supply chains.

Trust is recognized as a key to maintaining long-term relationships (Anderson and Weitz, 1989; Doney and Cannon, 1997; Ganesan, 1994) and contributing to firm's success in Chinese business communities (Liu and Wang, 2000; Wong, 1996). The trust of a Chinese businessman to others is assessed by his or her *xingyong*, which refers to the integrity, credibility, trustworthiness, and reputation of a person (Kiong and Kee, 1998). When trust is established, exchange parties will be more confident to engage in cooperative activities and avoid opportunistic behaviors (Morgan and Hunt, 1994). *Guanxi* involves reciprocal obligations and favors between two parties in personal or business relations, and has been long embedded in Chinese's social life (Liu and Wang, 2000; Luo, 1997). Chinese business community attaches great importance to cultivating, maintaining, and developing *guanxi*. In facing the high level of uncertainty, SMEs tend to use their *guanxi* networks to obtain favorable resources and information to aid their decision-making process (Fock and Woo, 1998; Yeung and Tung, 1996).

According to Emerson (1962), the power of a supplier over a retailer is increased by the level of retailer's dependence on the supplier. Dependence results from the need to maintain the channel relationship to achieve desired goals (Frazier 1983), and reflects the essentiality and replaceability of the goods and services provided by the supplier (Brown *et al.*, 1983; Heide and John, 1988). Power has been dichotomized into coercive and non-coercive power (i.e., reward, legitimate, referent, and expert power sources) (French and Raven, 1959). Effective use of power can achieve coordination in channel activities, increase satisfaction in buyer-supplier relationships (Brown *et al.*, 1983; Frazier and Summers, 1986), and enhance the performance of entire supply chain (Maloni and Benton, 2000).

A conceptual framework is based on the above dimensions has been shown in Figure 1. Based

on the preceding discussion, the following hypotheses were developed and tested:

H1: Retailer-supplier cooperation is positively related to (a) financial performance, (b) supply flexibility, and (c) customer service.

H2: Retailer's DMU is negatively related to (a) financial performance, (b) supply flexibility, and (c) customer service.

H3: Supply flexibility is positively related to (a) financial performance, and (b) customer service.

H4: (a) Retailer's trust in supplier, (b) Supplier's guanxi with retailer, (c) Retailer's dependence on supplier, (d) Supplier's use of coercive power source, and (e) Supplier's use of non-coercive power source is positively related to retailer-supplier cooperation.

H5: (a) Retailer's trust in supplier, (b) Supplier's guanxi with retailer, (c) Retailer's dependence on supplier, (d) Retailer-Supplier cooperation is negatively related to retailer's DMU, (e) Supplier's use of non-coercive power source.
(f) Supplier's use of coercive power source is positively related to retailer's DMU.

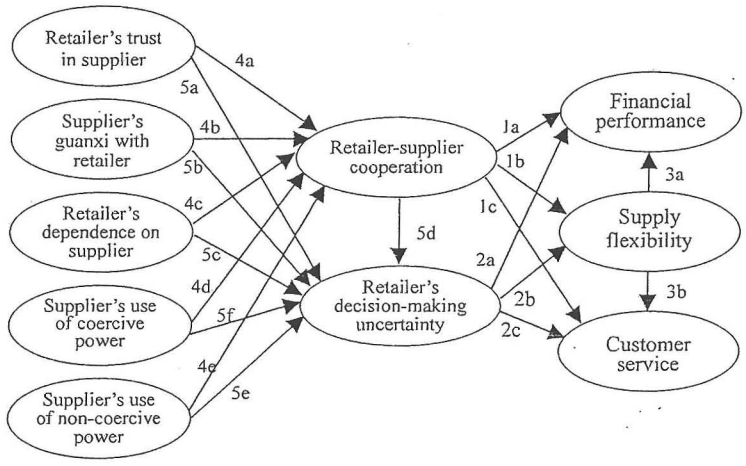

Figure 1: Conceptual Framework of Buyer-supplier Relationship

RESEARCH METHODOLOGY

According to the standards of SME promulgated by the Ministry of Economic Affairs (Small and Medium Enterprise Administration, 2004), SMEs are firms in commercial sector, industrial and commercial services industry with an annual sales revenue of less than NT$100 million, or with less than 50 regular employees. The informant is the retail store owner or manager. To obtain a higher response rate and to avoid non-response bias, face-to-face interviews were conducted using a structured questionnaire. In 2003, a total of 407 SME sporting goods retailers in Taiwan were approached by phone. 172 retail firms agreed to participate in the survey, representing a response rate of 42%. Some retailers who refused to participate indicated that they were busy, not interested, or unwilling to provide information they felt confidential.

Forty three scale items were designed to capture the retailer's perception of buyer-supplier relationship and its perception of DMU associated with the supply contract (i.e. advance buying contract) that its major supplier offers. Four cooperation scale was adapted from Doney and Cannon (1997) and Siguaw *et al.* (1998). Five items suggested by Achrol and Stern (1988) were modified and used to measure DMU in the context of retail business. For the performance measures, four items of financial performance were used from Lusch and Brown (1996), and eight items from Beamon (1999) and Cannon and Perreault (1999) for the scales of supply

flexibility and customer service. Five items measuring trust was adapted from Doney and Cannon (1997) and Ganesan (1994). For *guanxi*, eight items were adapted from Ambler (1999). Dependence was measured using a scale developed by Ganesan (1994). Nine items measuring coercive power and non-coercive power were chosen from Skinner *et al.* (1992).

DATA ANALYSIS

Profile of the Respondent. About 90% of the retail firms owned one to four outlets, among which 57% of retailers had one single outlet. 61% of the retail firms' annual sales income was less than NT$15 million, 13% with more than $15 million to $25 million, 18% with more than 25 million to 50 million, and 8% with more than 50 million to 0.1 billion.

Convergent Validity and Discriminant Validity. Anderson and Gerbin's (1988) two-step approach to the assessment of structural equation modeling was used to test the research model. First, Confirmatory Factor Analysis was used to validate the measurement model. The resulting measurement model $\chi^2_{(657)}$ was 927.85 (p=0.0) and the overall fit was acceptable (CFI=0.92, NNFI=0.91, and RMSEA=0.05). All indicators were loaded on their presupposed latent construct, and most factor loadings exceeded 0.7. The composite reliability, which assesses the inter-item consistency, exceeds the suggested minimum value of 0.7. The scales were all greater than 0.80, and the average variance extracted were all close or greater than 0.50 indicating adequate convergent validity (Fornell and Larcker, 1981). Discriminant validity was assessed if the average variance extracted (AVE) between two constructs was greater than the square of the correlation between two constructs (Fornell and Larcker, 1981). For example, the correlation between *guanxi* and coercive power, the lowest coefficient significant at p<0.05, was –0.19. The AVE between the two constructs was 0.64, which was greater than the square of the correlation between the two constructs 0.37. The results showed that all constructs used in the model are unique.

RESULTS AND DISCUSSION

The structural equations model was estimated using LISREL 8.3. The overall fit indices achieve satisfactory acceptance level, where (χ^2=927.85 [df=657], χ^2/df=1.41, p=0.00; RMSEA=0.049; CFI=0.915; NNFI=0.905). These indicate that the model fits the data very well.

The analysis showed that both the retailer-supplier cooperation and DMU are the two critical determinants of the retail supply chain performance. As hypothesized, the retailer-supplier cooperation had positive impact (b=0.22 p<0.01, b=0.29 p<0.001) and DMU (b=-0.48 p<0.001, b=-0.22 p<0.01) had negative impact on financial performance and supply flexibility. Retailer-supplier cooperation had a direct impact on customer service, and Retailer's DMU had an indirect impact on customer service through supply flexibility. Furthermore, supply flexibility had a positive effect on financial performance and customer service. These indicate that some operational inefficiency involves in current advance buying supply contract and thus undermines the financial and non-financial performance of the supply chain.

Retailer's trust in supplier, supplier's *guanxi* with the retailer, and supplier's use of non-coercive power source are the driving forces for enhancing retailer-supplier cooperation. Among the five relationship dimensions, *guanxi*, a Chinese cultural factor, contributed significantly to the development of retailer-supplier cooperation and also the mitigation of the retailer's DMU. To SME retailers, building personal relationships is still considered critical to obtain resources, businesses or market information they need, and help manage their uncertainty. Thus, the role of *guanxi* should not be neglected by those international brand suppliers.

Contrary to our prediction, retailer's dependence on the supplier and supplier's use of coercive power source did not have any impact on cooperation and retailer's DMU. Though the current market is dominated by a few top international suppliers, it seemed that the supplier's threatening strategies was not preferred, instead, supplier's non-coercive power source was perceived more acceptable. Supplier's providing incentive reward or expert consultation can facilitate communication and interaction with retailers. The retailer gains confidence from supplier's support and will experience less uncertainty in purchase decisions.

CONCLUSION AND IMPLICATIONS

This research showed that retailer-supplier cooperation and the retailer's DMU are critical determinants of the retail supply chain performance. The negative effect of retailer's DMU on financial performance reflected uncertainty impeded the retailer's profitability, sales growth, cash flow, and inventory turnover rate. Moreover, retailer-supplier cooperation is nurtured through trust, *guanxi* and non-coercive power. To develop good *guanxi* and appropriate use of non-coercive power source serve as a mechanism to reduce the retailer's DMU.

The managerial implications of negative direct and indirect effect of DMU on operational performance demonstrate that supply flexibility and customer service are critical differentiators in the current volatile sporting goods market. As stated by many retailers interviewed, frequent replenishments with small order quantity in season and some flexibility with partial returns to suppliers should be accommodated in current 'advance buying' contract to minimize inventory stocking. Supplier's incorporating the enhancement of operational efficiency will strengthen the cooperative relationships between retailers and suppliers. In the long run, the supply chain performance can be improved through the mitigation of the retailer's DMU in purchase and effective retailer-supplier cooperation.

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Table 1 Estimates of Measurement Model

Construct and Indicators	Standardized Estimate	*t*-value
Buyer-supplier cooperation (CR=0.81, AVE=0.59)		
co5 Work together towards common goals	0.74	10.78
co6 Problems are joint responsibilities	0.63	8.76
co7 Desire to maintain a good relationship	0.91	14.29
DMU (CR=0.81, AVE=0.53)		
un3 Adq info in minimizing stockout situation	0.68	9.41
un4 Have better inventory management	0.67	9.21
un5 Reduce product obsolescence	0.67	9.25
un6 Develop better business plans	0.87	13.20
Financial performance (CR=0.88,AVE=0.66)		
fn1 Average profit	0.73	10.67
fn2 Average sales growth	0.86	13.68
fn3 Cash flow	0.92	15.10
fn4 Inventory turnover rate	0.73	10.66
Supply flexibility (CR=0.82, AVE=0.49)		
sf1 Volume change	0.76	11.01
sf2 Product variety	0.75	10.85
sf3 Product delivery	0.83	12.61
sf4 Product pricing	0.63	8.56
sf5 Return goods policy	0.49	6.41
Customer service (CR=0.85, AVE=0.66)		
cs1 Product quality	0.79	11.76
cs2 Rate of delivery in full on time	0.82	12.36
cs3 Customer satisfaction	0.83	12.55

Construct and Indicators	Standardized Estimate	*t*-value
Trust (CR=0.87, AVE=0.58)		
ot1 Keeps promises	0.62	8.61
ot3 Concern our success	0.77	11.59
ot4 Consider our welfare	0.90	14.51
ot5 Is committed to us	0.77	11.44
ot6 Have confidence in supplier's motives	0.73	10.72
Guanxi (CR=0.87, AVE=0.62)		
gx1 Spend time getting to know us	0.83	12.85
gx2 Frequent visit us	0.88	14.11
gx3 Talk about common interests	0.80	12.23
gx7 Attend family events	0.61	8.40
Dependence (CR=0.86, AVE=0.67)		
dp1 Difficulty in making up sales volume	0.78	11.54
dp2 Product lines are essential	0.85	12.84
dp4 Difficulty to replace this supplier	0.82	12.22
Coercive power (CR=0.85,AVE=0.65)		
cp2 Take certain actions that reduce profits	0.87	12.92
cp3 Withdraw certain essential services	0.86	12.82
cp4 Cancel or refuse to renew contract	0.68	9.49
Non-coercive power (CR=0.89, AVE=0.62)		
np1 It's our duty to do as requested	0.60	8.39
np2 Admire supplier's way of running bus.	0.75	11.31
np3 Respect supplier's judgment	0.75	11.24
np4 Get good advice	0.91	15.00
np5 Possess business expertise	0.89	14.42

N=172.

All factor loadings are significant at $p<0.001$. CR: composite reliability, AVE: average variance extracted

Table 2 Results of Structural Model

	Hypothesized relationship	Path coefficient	*t*-value
	Direct effect		
H1a	Cooperation --> Financial	0.22	2.71**
H1b	Cooperation --> Flexibility	0.29	3.22***
H1c	Cooperation --> Service	0.37	4.55***
H2a	DMU --> Financial	-0.48	-5.11***
H2b	DMU --> Flexibility	-0.22	-2.38**
H2c	DMU --> Service	-0.01	-0.16
H3a	Flexibility --> Financial	0.16	1.95*
H3b	Flexibility --> Service	0.51	5.70***
H4a	Trust --> Cooperation	0.38	4.12***
H5a	Trust --> DMU	-0.13	-1.16
H4b	Guanxi --> Cooperation	0.24	2.67**
H5b	Guanxi --> DMU	-0.28	-2.43**
H4c	Dependence --> Cooperation	0.12	1.35
H5c	Dependence --> DMU	-0.01	-0.07
H4d	Coercive power --> Cooperation	-0.09	-1.16
H5f	Coercive power --> DMU	-0.03	-0.33
H4e	NC power --> Cooperation	0.17	1.76*
H5e	NC power --> DMU	-0.33	-2.76**
H5d	Cooperation --> DMU	0.16	1.25
	Indirect effect		
1	Trust --> Financial	0.14	2.20*
2	Trust --> Flexibility	0.13	2.77**
3	Trust --> Service	0.21	3.72***
4	Guanxi --> Financial	0.19	2.96**
5	Guanxi --> Flexibility	0.12	2.90**
6	Guanxi --> Service	0.16	2.94**
7	NC power --> Financial	0.20	2.98**
8	NC power --> Flexibility	-0.11	2.57**
9	NC power --> Service	0.12	2.24*
10	Cooperation --> Service	0.13	2.33**
11	DMU --> Service	-0.11	-2.23*

(1) Only significant indirect effect paths are shown. (2) Significant at * p<0.05, ** p<0.01, *** p<0.001

(3) One-tailed test was used to test all hypotheses. (4) NC power: Non-coercive power